

## ABSTRACT

Charles University in Prague

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology and Toxicology

Candidate: Mgr. Iva Prokopová

Supervisors: RNDr. Aleš Stuchlík, PhD (FgÚ AV ČR, v.v.i.)

Doc. PharmDr. Petr Pávek, PhD (FaF, UK)

Title of rigorous thesis: Systemic coapplication of  $\alpha_1$ - and  $\beta$ -adrenergic antagonists and their effects on rat cognition

Spatial learning is a widely-studied type of animal behavior, often considered as a model of human higher cognitive functions. Noradrenergic receptors play a modulatory role in vigilance, attention, reward, learning and memory. The present study aimed at studying the effects of separate or combined systemic administration of  $\alpha_1$ -adrenergic antagonist prazosin (1 and 2 mg/kg) and  $\beta$ -blocker propranolol (5 and 20 mg/kg) on hippocampus-dependent learning of the active allothetic place avoidance (AAPA) task. Both centrally-active drugs impaired spatial learning when administered together, exerting no effect after separate applications. Locomotion was impaired only by combined application of higher doses of both drugs (2 mg/kg prazosin and 20 mg/kg propranolol). These results suggest an *in vivo* interaction between these two types of receptors in regulation of spatial navigation. Since there are several combined adrenoceptor blockers (antagonizing both  $\alpha$ - and  $\beta$ -adrenoceptors and crossing the blood-brain-barrier) marketed for human use, it might represent an appealing challenge to investigate intimately cognitive functions in patients under these treatments to screen for their potential cognitive side-effects.